

# THE BRITISH ASTRONOMICAL ASSOCIATION



## LUNAR SECTION CIRCULAR

Director Alan Wells  
Assistant Director/Editor John Pedler

Volume 42 No. 9      Data on pages 7-8 are for Oct. 2005      Lunations 1022/1023      September 2005

### TOPOGRAPHICAL SUB-SECTION

COLIN EBDON

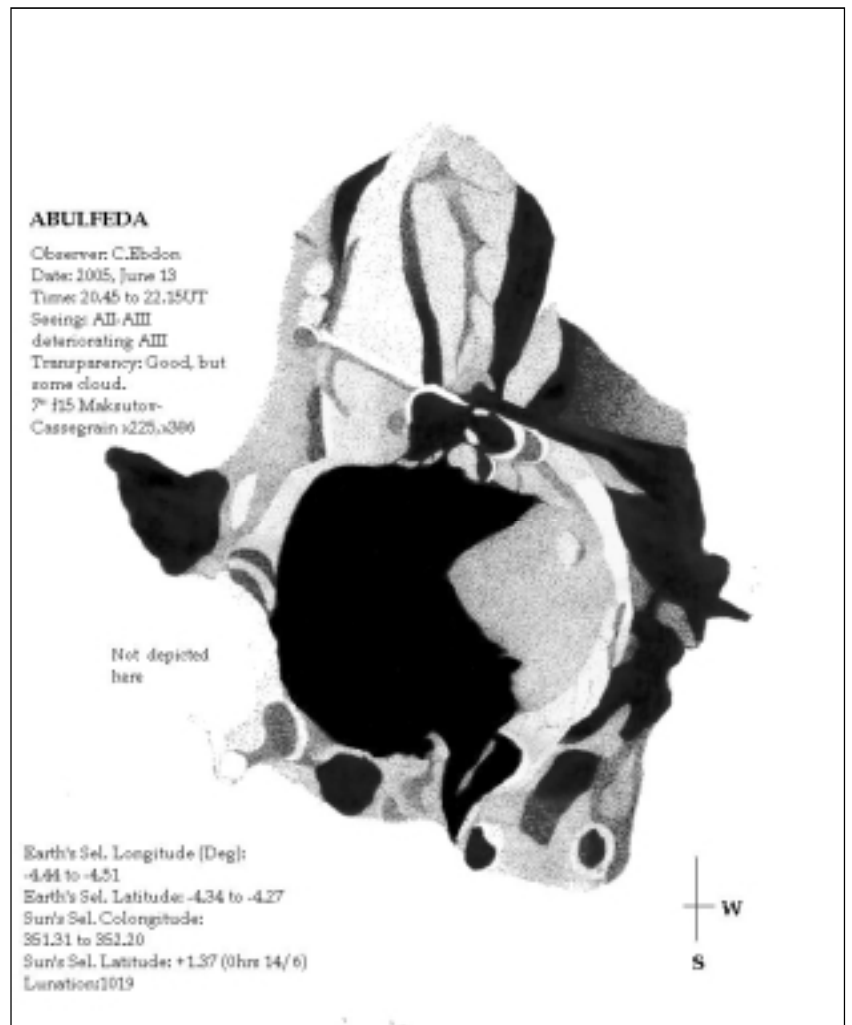
The Latin term 'Catena' meaning 'crater chain' is not one that figures very often in members observations, largely because most of these features are difficult to observe successfully without exceptional seeing conditions or because they are rather obscure. Rukl's atlas lists eight of them in total, but there are many more. Some are disguised by the fact that they are designated as another more familiar type of topographical feature - the 'Rima' or rille in particular. The prime example of this is the Hyginus rille which, for much of its length, consists of a chain of small craters, interspersed by a narrow valley.

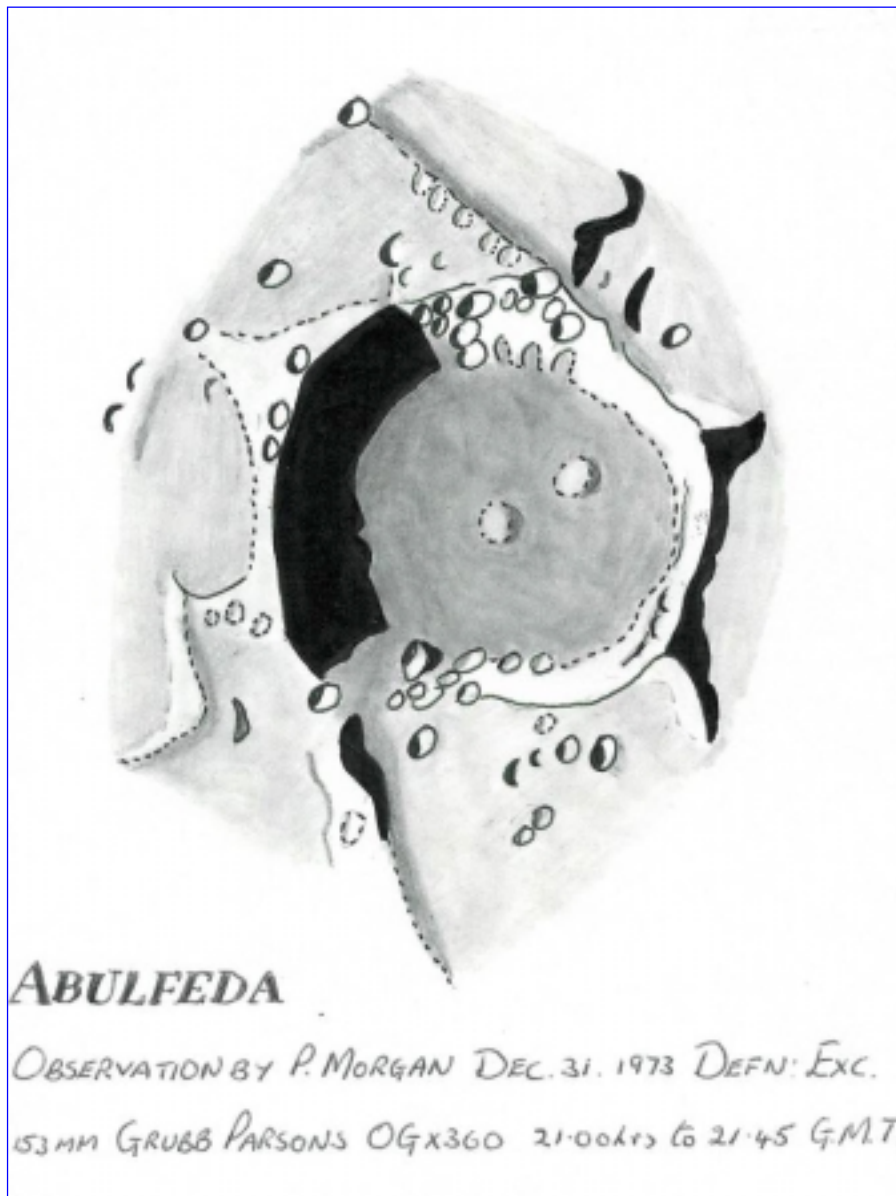
I had not realised until recently that there is one such feature associated with the crater Abulfeda. It was only when observing this crater in June and noting a hair-thin bright straight line adjoining the crater that I investigated further. In this instance the 'chain' seems to consist of several small craters followed by a short ridge (possibly with smaller pits or shallow craters along its length) which terminates in another shallow crater.

I have included my rather uninformative drawing of Abulfeda here, along with (possibly a first for this Circular) an observation of the same region made some 32 years earlier by Phil Morgan, which shows much more detail!

One of the more notable true crater chains is the 50km long feature associated with the crater Davy, although the individual craters are rather small and need good seeing and the right lighting conditions in order to tackle them successfully. Oddly, perhaps, there seem to be many more prominent crater chains on the Moon which have not been classified or named as such. There is one associated with the crater Muller, East of Ptolemaeus and another stretching northward from the nearby (very impressive) crater Albategnius. I would certainly be interested to receive any members observations of crater chains, designated or otherwise, that they may have in their archive.

Most lunar observers will now be looking forward to the start of the principal 'observing season'. Hopefully this year, the 'season of mists and mellow fruitfulness' will bring forward some lengthy clear periods with still air and fine seeing. It did not last year, but we live in hope! Please remember that I rely on others to fill these pages and also those of 'The New Moon' so please do let us all hear about what you observe.





CLOUDWATCH

Andrew Bytnar

Tabulated data for May

<u>Observer and location</u>	<u>Excellent</u> <i>days</i>	<u>Cloudy</u> <i>days</i>	<u>Overcast</u> <i>days</i>	<u>Hazy</u> <i>days</i>	<u>No watch</u> <i>days</i>
P.Burt (Chatham)	5 (16%)	7 (23%)	12 (39%)	0 ( 0%)	7 (23%)
A.Bytnar (Mansfield)	8 (26%)	14 (45%)	8 (26%)	1 ( 3%)	-----
M.Cook (Cromer)	12 (39%)	9½ (31%)	9½ (31%)	0 ( 0%)	-----
K.Hall (Warrington)	6½ (21%)	11 (35%)	8 (26%)	1 ( 3%)	4½ (15%)
A.Heath (Nottingham)	9 (29%)	8 (26%)	14 (45%)	0 ( 0%)	-----
J.Wrigley (Reading)	6½ (21%)	12 (39%)	12 (39%)	0½ ( 2%)	-----

Tabulated data for June 2005

<u>Observer and location</u>	<u>Excellent</u> <i>days</i>	<u>Cloudy</u> <i>days</i>	<u>Overcast</u> <i>days</i>	<u>Hazy</u> <i>days</i>	<u>No watch</u> <i>days</i>
P.Burt (Chatham)	10 (33%)	5 (17%)	15 (50%)	0 ( 0%)	-----
M.Cook (Cromer)	6 (20%)	3 (10%)	21 (70%)	0 ( 0%)	-----
K.Hall (Warrington)	9 (30%)	8½ (28%)	8 (27%)	0 ( 0%)	4½ (15%)
A.Heath (Nottingham)	5 (17%)	11 (37%)	14 (47%)	0 ( 0%)	-----
J.Wrigley (Reading)	5 (17%)	11½ (38%)	12 (40%)	1½ ( 5%)	-----

## LUNAR DOMES: THE JOINT CATALOGUE PROJECT Raefello Braga

which is based not only on domes morphology but also on their geological setting.

Domes are low swelling on the lunar surface that are similar to many shield volcanoes found on Earth and Mars, and a detailed knowledge of their placements and physical characteristics can be of considerable value to selenologists in unraveling the history of the Moon and the role of the volcanic processes in the evolution of the lunar surface. In 1962, the Lunar Section of the Association of Lunar and Planetary Observers (ALPO) began a study of these features that lasted some 14 years and produced an incomplete listing of about 600 possible domes. The project's aim was to classify and describe these features while continuing to discover additional ones.

After some years of inactivity the dome survey re-started in 1987 leading to the publication of a revised and expanded dome catalogue in 1992 [1]. The catalogue listed the positions of about 700 domes giving orthographic and selenographic positions, dimensions and description for each of them, when available. Many domes were also classified by using of the classification scheme developed in 1964 by John Westfall and still in use today. Since then the catalogue formed the main reference for lunar dome researches for amateur astronomers, but over the time it became also apparent that the catalogue contained many spurious entries, incorrect positions and dimensions, and gaps of data.

In order to provide the amateur and professional communities with a comprehensive, updated and reliable source of information on lunar domes, the ALPO, BAA, UAI (Italian Amateur Astronomers Union) and ALS (American Lunar Society) joined to revise the 1992 ALPO catalogue. The scope of the work is to produce something similar to a "Messier list" for lunar domes that amateurs and scientists can use for research purposes as well as to check whether an observed dome-like feature is a true dome or not. Therefore the list will contain data for true volcanic domes and for any dome-like feature of non-volcanic origin that can be confused with volcanic ones. In addition, recently identified domes will be added to the list and new determinations of positions and sizes will be added to correct the older ones. Among the purposes of the project there is also the revision of the domes classification by including in the catalogue the scheme developed by J. Head and A. Gifford in the seventies [3]

Section members are invited to participate in the project by submitting their dome observations, draw-



ings and CCD images to the Geological Sub-section following the standard reported on the Internet page [http://luna.uai.it/domi/how\\_to\\_submit\\_observations.htm](http://luna.uai.it/domi/how_to_submit_observations.htm). CCD images are particularly useful because they allow careful measurements and positioning of domes. A useful introduction to lunar domes can be found at the UAI English page address: [http://luna.uai.it/domi/lunar\\_domes\\_uai\\_lunar\\_section.htm](http://luna.uai.it/domi/lunar_domes_uai_lunar_section.htm). Observations received will be published on the subsection web page (<http://www.baalunarsection.org.uk/html/geological.html>) which is under construction and updating.

[1] Jamieson H.D., Phillips J.H. (1992) Lunar Dome Catalog (April 30, 1992 Edition), JALPO, 36, 3, pp 123-129

[2] Westfall J.E. (1964) A Generic Classification of Lunar Domes, JALPO 18, 1-2, pp 15-20

[3] Head J.W., Gifford A. (1980) Lunar mare domes: classification and modes of origin, *The Moon and the Planets*, 235-258

Figure: The domes Arago Alpha and Beta, imaged by Giorgio Mengoli.

Observations for July were received from: Michael Amato (CT, USA), Clive Brook (Plymouth, UK), Antonio Marino (Italy), Brendan Shaw (UK), and William Watson (USA). The total observing time for July was only 6 hours. Clearly the low altitude of the Moon, poor weather, and vacations have had a detrimental effect!

On 2005 Jul 11 at 01:18 UT William Watson (Tonawanda, NY) reported: “*a bright flash in the northern hemisphere of the moon's earthshine with the naked eye. I estimated that it was brighter than Jupiter at about -3 or -4 magnitude and lasted for about 0.5 sec with no indication of motion. It could have been a meteor coming toward me, or my eyes playing tricks on me, but it certainly looked real. It was an evening with heavy hazy cirrus clouds, and nearby Jupiter could only be seen, if you new where to look for it.*” Although observers are encouraged to report such observations to the impact flash group of ALPO, run by Brian Cudnik, he was away and so asked me to check if anybody else was observing around this time – if so then please email Brian Cudnik on: [cudnik@sbcglobal.net](mailto:cudnik@sbcglobal.net)

I received the a communication from John Hauk (USA, Email: [remmy19822002@cs.com](mailto:remmy19822002@cs.com)), concerning a couple of theories that he has been developing about TLP, so I thought they might be worth a quick mention to see what others think:

- A) The areas where TLP brightening phenomena have occurred are often made up of made up of high density quartz, and when these are compressed, cause a brightening effect - this utilizes lunar seismic activity
- B) During compression of certain soil compositions around these LTP areas, weak magnetic fields are created. Protons and high-energy particles then hit these magnetic fields and cause energy exchanges, which come out as light.

I suppose one of the problems of this electrodynamic effect is that much of the lunar surface is made up from loose rock and is anyway coated mostly by regolith. The latter will quite likely to obscure any largish contiguous rock units. Having said that though the as the lunar nearside presents a surface area of 20 million km sq, statistically there could well be some areas of exposed solid rock. A similar theory for (A) has been proposed before e.g. by Zito in his 1989 paper in *Icarus*.

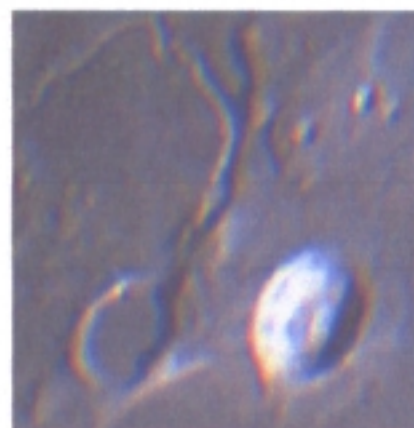


Fig 1 Location of the 1963 spots

Fig 2 Antonio Marino's image

Fig 3. Simulated spurious colour

Antonio Marino took a really interesting image of Aristarchus on 2005 Jul 18<sup>th</sup>. I have been awaiting to see this image of the crater for many years now. It is important because it was within +/- 1deg of both the illumination and libration conditions of the famous Greenacre and Barr observation (fig 1) from 1963 that kick started much of subsequent LTP observations. Antonio's image (fig 2) was in black and white, but it enables us to model atmospheric spurious colour which some have suspected might have caused the 2 suspected red spots from this 1963 TLP (fig 1). Having added exaggerated artificial colour (see fig 3), in the direction that prismatic spectral dispersion should occur in, it is clear that this does not cause red spots at the locations seen in 1963.

Indeed other more obvious spurious colour is visible elsewhere. I have checked for spurious colour in other directions (re-Fitton's theory from the 1970's) but none of these yielded the red spots either. So one is left to conclude that maybe Greenacre and Barr did see a real TLP back in 1963, and after all at an altitude of 30 deg above the horizon, spurious colour, if present, should have been minimal < 1". If it was present then it should have been a lot more prominent elsewhere on crater rims, but this was not reported at the time.

Finally, the following repeat illumination and libration events for UK observers occur for September:

Event: Plato (Elger, 1887 Feb 01) can be seen on/from (UTC): 2005 Sep 11 (19:40-20:02) – [*Look for ill-defined shadow peaks on the W. border*]

Event: Proclus (Cook, 1989 Jul 13) can be seen on/from (UTC): 2005 Sep 13 (19:07-22:32) – [*Measure the size and location of a circular dark patch on the floor*]

Event: South East of Langrenous (Baum, 1947 Aug 28) can be seen on/from (UTC): 2005 Sep 15 (19:26-19:41) – [*Can you see blue mountain on the limb?*]

Event: Conon (Jean, 1968 Jul 07) can be seen on/from (UTC): 2005 Sep 15 (20:7-22:00) – [*Look for variability in a rectangular shaped dark patch*]

Event: Plato (Jean, 1968 Jul 07) can be seen on/from (UTC): 2005 Sep 15 (20:7-22:00) – [*Look for a brilliant spot SE? of the crater*]

Event: Teneriffe Mts (Jean, 1968 Jul 07) can be seen on/from (UTC): 2005 Sep 15 (20:7-22:00) – [*Sketch or image the area*]

Event: Messier A (Moore, 1951 Aug 20) can be seen on/from (UTC): 2005 Sep 20/21 (20:09-00:03) – [*Monitor the sharpness and brightness of the interior circular bright patch*]

Further predictions, including the more numerous illumination only events can be found on the following web site: <http://www.cs.nott.ac.uk/~acc/Lunar/tlp.pdf>. For members who do not have access to the internet, please drop me a line and I will post predictions to you. If you would like to join the TLP telephone alert team, please let me know your phone No. and how late you wish to be contacted. If in the unlikely event you see a TLP, please give me a call on my cell phone: +44 (0)798 505 5681 and I will alert other observers. Note when telephoning from outside the UK you must not use the (0). When phoning from within the UK please do not use the +44!

Dr Anthony Cook, School of Computer Science & IT, Nottingham University, Jubilee Campus, Wollaton Road, Nottingham, NG6 1BB, UNITED KINGDOM. Email: [acc@cs.nott.ac.uk](mailto:acc@cs.nott.ac.uk)

CLOUDWATCH cont.

Andrew Bytnar

Tabulated data for July 2005

<u>Observer and location</u>	<u>Excellent</u> <i>days</i>	<u>Cloudy</u> <i>days</i>	<u>Overcast</u> <i>days</i>	<u>Hazy</u> <i>days</i>	<u>No watch</u> <i>days</i>
P.Burt (Chatham)	9 (29%)	7 (23%)	12 (39%)	0 ( 0%)	3 (10%)
A.Bytnar (Mansfield)	7 (23%)	8 (26%)	11 (35%)	1 ( 3%)	4 (13%)
M.Cook (Cromer)	3 (10%)	7½ (24%)	18½ (60%)	2 ( 6%)	-----
K.Hall (Warrington)	8 (26%)	8 (26%)	14 (45%)	1 ( 3%)	-----
A.Heath (Nottingham)	6 (19%)	9 (29%)	16 (52%)	0 ( 0%)	-----
J.Wrigley (Reading)	4½ (15%)	10 (32%)	11½ (37%)	0 ( 0%)	5 (16%)

Only one suitable grazing occultation is predicted for this month – track 20 in last month’s Circular (track 10 in the BAA Handbook). It occurs on the night of October 22/23, starting in the west at about 03.10 UT (04.10 BST). The star is magnitude 6 and the moon is at an elevation of 60 degrees in the south east. The graze occurs against the dark limb at the western end of the track although it encroaches on the terminator area eastwards of 2 degrees west. The track hits the south Wales coast near Milford Haven, travels east across south Wales, through Hereford and Worcester, Warwicks, Northants, Cambs, and along the Norfolk/Suffolk border. (Of the other two grazes this month, the first barely touches land in the Hebrides, and the other occurs entirely against the bright limb.)

There is a good number of bright, easily observable, total occultations this month as the moon passes high through well populated star regions – have a go!

**Predictions for 52°27'41.4"N 1°44'44.0"W (Birmingham) – October 2005**

Day	Time-UT	P	Object	O	Max Sp	%	Elg	Sn	Mn	Mn	CA	PA	Watts	a	b	Star's	apparent
	H	M	S	D	Reference	V	Mag	Snlt	Alt	Alt	Az	Angle	Min/°	RA	Dec		
1/04	10	32/R	PPM 157445	95	8.5 G5	5-	25		4	81	34N	355 334	-.3-1.8	110231.9	85030		
1/04	41	09/R	PPM 157448	95	8.7 F8	5-	25		9	87	83S	292 271	-.1 .8	110237.4	83447		
1/04	49	36/R	PPM 157467	95	8.5 F5	5-	25		10	88	17N	11 350	-.7-6.7	110400.1	84207		
12/20	38	31/D	PPM 272428	38	5.5 K0	73+	118		16	188	79S	81 98	-.8 -.1	212429.8	-204944		
ABOVE STAR IS A VARIABLE STAR -- MINIMUM MAGNITUDE = 5.8.																	
14/22	56	14/D	PPM 207366	88	4.9 MB	91+	146		28	199	41N	14 36	-.3 1.0	231709.8	-74139		
ABOVE STAR IS A VARIABLE STAR -- MINIMUM MAGNITUDE = 5.1.																	
18/22	30	39/R	FK5EXT 2190	96	6.5 K0	97-	161		45	125	35S	190 206	.1 2.6	24439.4	174728		
19/22	39	08/R	PPM 92691	86	6.6 A0	93-	149		43	110	72N	269 281	-.6 .9	33901.9	224051		
20/00	22	21/R	PPM 92755	95	7.3 F2	92-	148		55	140	53S	214 226	-.5 1.7	34237.2	224826		
20/04	06	38/RK	PPM 92918	88	5.5 B8	92-	146		52	232	71S	233 244	-.8 .3	34842.2	232629		
20/04	59	50/R	PPM 92951	87	6.1 B8	92-	146		46	247	66N	276 287	-.6-1.0	35005.0	234355		
20/04	59	38/RW	PPM 92961	96	6.8 B9	92-	146		46	247	33N	309 320	-.5-2.2	35019.5	235207		
20/23	09	25/R	PPM 93640	95	7.6 K2	86-	136		42	102	13S	181 188	1.8 6.6	43746.6	254428		
21/21	59	40/RX	PPM 94443	85	7.4 F8	79-	125		25	76	35N	318 321	-.6 .2	53145.2	274631		
22/00	12	30/RV	PPM 94540	77	6.5 K0	78-	124		44	102	61S	235 237	-.3 1.6	53617.9	274005		
22/05	18	48/RM	PPM 94792	75	8.2 A0	76-	122		61	223	53N	302 303	-.8-1.3	54521.5	281156		
23/00	23	06/RX	PPM 96140	66	7.5 K5	69-	112		38	93	58S	239 236	-.2 1.7	63324.2	274922		
23/00	24	56/R	PPM 96143	65	7.6 A2	69-	112		39	93	62N	300 296	-.6 .4	63327.1	280444		
23/00	47	47/R	PPM 96162	65	7.8 K2	69-	112		42	98	89N	272 269	-.5 .9	63403.7	275839		
23/01	34	52/R	PPM 96215	69	5.0 A0	69-	112		49	108	84N	277 274	-.7 .7	63534.3	280109		
ABOVE STAR IS A VARIABLE STAR -- MINIMUM MAGNITUDE = 5.3.																	
23/03	25	25/RC	PPM 96301	76	7.4 A2	68-	111		62	144	36S	218 214	-.7 2.2	63915.8	274803		
23/04	47	34/RC	PPM 96376	87	6.5 K0	68-	110		66	183	31N	332 327	-.8-2.4	64143.1	281134		
24/03	17	33/R	PPM 97668	65	8.3 K7	59-	100		54	123	55S	243 235	-.7 1.4	73338.5	262657		
24/04	34	07/R	PPM 97714	65	8.4 K0	59-	100		62	152	73N	295 286	-.9 -.3	73542.6	263529		
25/00	01	45/R	PPM 98584	66	7.0 G5	50-	90		17	73	81S	274 261	.0 1.2	81929.7	240929		
25/00	39	08/R	PPM 98611	68	5.9 A0	50-	90		23	80	55S	248 235	.1 1.7	82052.6	240020		
25/03	03	29/R	PPM 98679	67	7.3 F0	50-	89		44	109	80S	274 261	-.6 .8	82515.6	235542		
25/04	21	35/R	PPM 98713	65	8.5 G5	49-	89		54	131	59S	253 240	-.8 1.1	82724.5	234236		
26/04	18	04/R	PPM 99441	65	8.7 F	39-	77		44	119	69S	268 251	-.7 .9	91623.7	200303		
27/02	58	37/RC	PPM 127017	66	7.6 K0	31-	67		24	95	90S	292 273	-.4 .7	100049.9	155017		
27/03	30	49/R	PPM 127028	66	7.8 K0	31-	67		28	101	65S	267 248	-.4 1.2	100139.0	153840		
27/05	56	09/R	PPM 127087	75	8.2 K0	30-	66	-9	46	138	38S	240 221	-1.0 1.6	100521.6	150630		
28/04	39	04/R	PPM 127711	76	8.0 A3	22-	56		28	111	87N	298 277	-.5 .4	104803.9	102454		
28/05	36	37/R	PPM 127725	76	7.9 A0	22-	55		35	124	72S	276 256	-.7 .7	104920.6	100746		
28/05	50	14/R	PPM 127752	95	8.6 M1	21-	55-10		37	127	17N	8 347	-.1-5.2	105048.1	101805		
30/04	54	00/RC	PPM 178729	96	7.6 K0	8-	33		9	104	36S	241 219	-.4 2.3	121516.5	-12124		

**N.B. Don't forget to add 1 hour to the above times during British Summer Time (until October 30).**

Predictions courtesy of the International Occultation Timing Association – European Section – (IOTA/ES) “OCCMOON” program.

A letter in the "D" column indicates a possible double star.

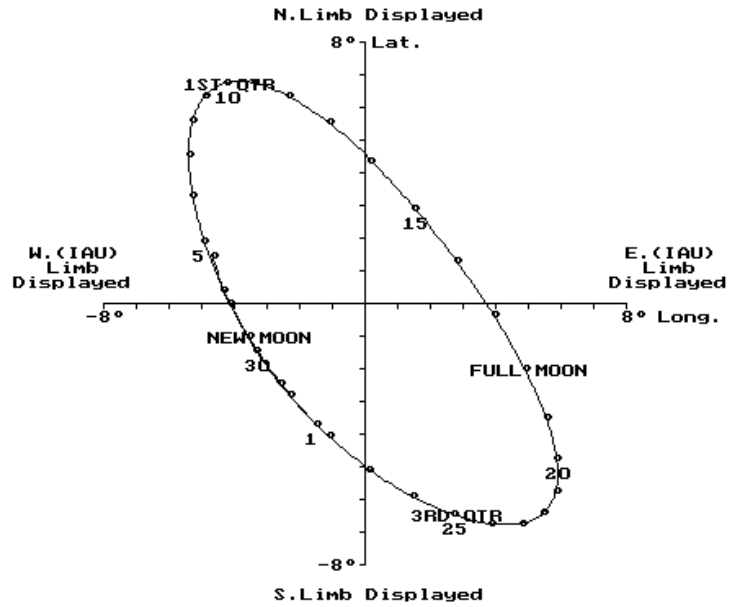
See LSC 35, 5 (May 1999) for comments on recording observations using the predictions.

# LIBRATION October 2005

Date	Libration amount $\varnothing$	PA $\varnothing$	Feature presented
1.0	3.3	163	Legentil
2.0	2.9	130	Graff
3.0	3.3	98	Schluter*
4.0	4.3	76	Bohr*
5.0	5.5	63	Voskresenskiy*
6.0	6.6	54	Ulugh Beigh*
7.0	7.6	48	Bunsen*
8.0	8.4	43	Gerard*
9.0	8.8	38	Galvani*
10.0	8.8	34	Volta*
11.0	8.4	29	Oenopides*
12.0	7.6	24	Pythagoras*
13.0	6.4	17	Anaximander*
14.0	5.0	6	Mouchez
15.0	3.7	345	Petermann
16.0	3.0	309	Riemann
17.0	3.7	273	Peek
18.0	5.0	252	Gibbs
19.0	6.4	241	W. Humboldt*
20.0	7.5	235	Abel*
21.0	8.2	229	Gum*
22.0	8.5	225	Hamilton*
23.0	8.3	221	Peirescius*
24.0	7.8	216	Brisbane*
25.0	6.9	210	Hanno*
26.0	5.9	202	Helmholtz*
27.0	4.7	191	Demonax*
28.0	3.6	173	Casatus*
29.0	2.9	145	Pingre
30.0	2.9	109	Eichstadt

**LUNAR LIBRATIONS - October 2005**

Geocentric: —○—○— The markers show 0:00H UT



Program by Bob Roberts.

Observer at: Lat. 51.0 $\varnothing$ N, Long. 1.0 $\varnothing$ W

\* indicates that the feature is not illuminated.

2005 OCT.	Age d	Phase	Earth's Selenographic		Sun's Selenographic		R.A.		Dec. °	Rises		Sets		Transit		Alt °
			Longø	Latø	Colongø	Latø	h	m		h	m	h	m	h	m	
1.0	27.2	0.057	-1.5	-3.8	244.2	0.18	10	53	10.3	03	31	17	13	10	30	45
2.0	28.2	0.020	-2.6	-2.5	256.4	0.16	11	36	4.6	04	43	17	23	11	11	39
3.0	29.2	0.002	-3.6	-1.1	268.6	0.13	12	19	-1.2	05	56	17	32	11	51	33
4.0	0.6	0.003	-4.3	0.4	280.8	0.11	13	03	-7.1	07	11	17	43	12	33	27
5.0	1.6	0.025	-4.9	1.9	293.1	0.09	13	49	-12.9	08	30	17	55	13	18	22
6.0	2.6	0.068	-5.3	3.3	305.3	0.06	14	38	-18.1	09	51	18	12	14	07	17
7.0	3.6	0.130	-5.4	4.6	317.5	0.03	15	31	-22.7	11	15	18	36	14	59	13
8.0	4.6	0.210	-5.3	5.6	329.7	0.00	16	27	-26.1	12	37	19	13	15	56	10
9.0	5.6	0.306	-4.9	6.3	341.9	-0.03	17	27	-28.2	13	48	20	07	16	57	9
10.0	6.6	0.412	-4.3	6.7	354.1	-0.06	18	29	-28.5	14	42	21	20	17	58	10
11.0	7.6	0.525	-3.4	6.7	6.3	-0.09	19	32	-27.1	15	20	22	47	18	58	13
12.0	8.6	0.638	-2.3	6.3	18.5	-0.13	20	33	-23.9	15	45	..	..	19	55	17
13.0	9.6	0.745	-1.1	5.5	30.6	-0.16	21	32	-19.2	16	03	..	..	20	49	23
14.0	10.6	0.840	0.2	4.4	42.8	-0.20	22	27	-13.4	16	18	01	51	21	40	30
15.0	11.6	0.916	1.6	2.9	55.0	-0.24	23	20	-6.8	16	30	03	21	22	29	37
16.0	12.6	0.970	2.9	1.3	67.1	-0.28	00	11	0.1	16	41	04	49	23	18	44
17.0	13.6	0.997	4.0	-0.4	79.3	-0.31	01	02	7.0	16	54	06	16	..	..	..
18.0	14.6	0.997	4.9	-2.1	91.4	-0.35	01	54	13.4	17	08	07	44	00	07	51
19.0	15.6	0.972	5.6	-3.6	103.6	-0.38	02	47	19.0	17	27	09	11	00	56	56
20.0	16.6	0.925	5.9	-4.9	115.7	-0.42	03	41	23.4	17	53	10	36	01	50	61
21.0	17.6	0.860	5.9	-5.8	127.9	-0.44	04	38	26.6	18	30	11	53	02	45	64
22.0	18.6	0.781	5.5	-6.5	140.1	-0.47	05	35	28.3	19	19	12	57	03	40	66
23.0	19.6	0.694	4.8	-6.8	152.2	-0.49	06	31	28.5	20	22	13	45	04	34	66
24.0	20.6	0.601	3.9	-6.8	164.4	-0.51	07	26	27.3	21	33	14	18	05	27	64
25.0	21.6	0.506	2.8	-6.5	176.6	-0.53	08	18	24.8	22	47	14	42	06	16	61
26.0	22.6	0.412	1.5	-5.9	188.7	-0.55	09	07	21.3	..	..	14	58	07	02	58
27.0	23.6	0.321	0.2	-5.1	200.9	-0.57	09	54	17.0	..	..	15	11	07	45	53
28.0	24.6	0.236	-1.1	-4.1	213.1	-0.58	10	39	12.0	01	14	15	22	08	26	48
29.0	25.6	0.160	-2.3	-2.9	225.3	-0.60	11	22	6.5	02	26	15	31	09	07	42
30.0	26.6	0.095	-3.3	-1.5	237.5	-0.62	12	05	0.7	03	39	15	40	09	47	36
31.0	27.6	0.045	-4.1	-0.0	249.7	-0.63	12	49	-5.2	04	54	15	51	10	29	30
NOV.																
1.0	28.6	0.012	-4.7	1.5	261.9	-0.65	13	35	-11.1	06	11	16	02	11	13	24
2.0	29.6	0.000	-4.9	2.9	274.1	-0.67	14	23	-16.6	07	33	16	18	12	01	18
3.0	0.9	0.011	-4.9	4.2	286.3	-0.69	15	15	-21.5	08	58	16	40	12	53	14
4.0	1.9	0.045	-4.5	5.3	298.6	-0.72	16	12	-25.3	10	23	17	13	13	50	11
5.0	2.9	0.101	-4.0	6.1	310.8	-0.74	17	12	-27.8	11	40	18	01	14	51	9
6.0	3.9	0.178	-3.2	6.6	323.0	-0.76	18	15	-28.5	12	40	19	10	15	53	9
7.0	4.9	0.272	-2.3	6.7	335.1	-0.79	19	18	-27.5	13	22	20	33	16	53	12
8.0	5.9	0.379	-1.3	6.4	347.3	-0.82	20	20	-24.7	13	50	22	03	17	51	16
9.0	6.9	0.492	-0.3	5.6	359.5	-0.85	21	18	-20.4	14	10	..	..	18	44	21
10.0	7.9	0.606	0.7	4.6	11.7	-0.88	22	13	-14.9	14	25	..	..	19	35	28
11.0	8.9	0.714	1.6	3.2	23.8	-0.91	23	05	-8.7	14	37	01	01	20	23	34
12.0	9.9	0.811	2.5	1.7	36.0	-0.95	23	55	-2.0	14	48	02	27	21	10	41

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**Items for the Oct. 2005 circular should reach the Editor by the 10th Sept. 2005**